

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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PCT

To:

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NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing  
(day/month/year)

11.12.2003

Applicant's or agent's file reference  
2002B039A

**IMPORTANT NOTIFICATION**

International application No.  
PCT/US03/09734

International filing date (day/month/year)  
28.03.2003

Priority date (day/month/year)  
29.03.2002

Applicant  
EXXONMOBIL CHEMICAL PATENTS INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

**4. REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

ACKNOWLEDGED  
PAA Group

RECEIVED

Name and mailing address of the international  
preliminary examining authority:



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☒ FYI  
☐ File

DEC 16 2003

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**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002B039A	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA416)	
International application No. PCT/US03/09734	International filing date ( <i>day/month/year</i> ) 28.03.2003	Priority date ( <i>day/month/year</i> ) 29.03.2002
International Patent Classification (IPC) or both national classification and IPC C07C45/50		
Applicant EXXONMOBIL CHEMICAL PATENTS INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of    sheets.

3. This report contains indications relating to the following items:

- I    ☒ Basis of the opinion
- II   ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V    ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  09.09.2003	Date of completion of this report  11.12.2003
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Bedel, C  Telephone No. +49 89 2399-2506 <div style="text-align: right;">  </div>

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/US03/09734**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

**Description, Pages**

1-16 as originally filed

**Claims, Numbers**

1-11 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/US03/09734**

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**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

The present application concerns a hydroformylation process of olefin in the presence of a cobalt catalyst, including a demetalling step wherein the cobalt is recovered as cobalt acetate or formate, forming an aqueous solution which is evaporated, the acid and water being distilled overhead and a concentrated solution of cobalt acetate or formate being withdrawn as bottoms from the evaporator. The present method excludes processes including the recycling of cobalt carbonyl back to the hydroformylation reactor using a vapor stream carrier (stripping, flash...).

D1: US-A-2834815

D2: US-A-5237105

D1 discloses a hydroformylation process wherein the aqueous cobalt acetate solution is evaporated to dryness and the resulting solid is directly recycled back to the reactor as a slurry.

D2 discloses a hydroformylation process wherein the aqueous cobalt acetate solution is concentrated and mixed with alcohol and synthesis gas to be converted to cobalt carbonyl. The latter is stripped as a vapor stream back to the hydroformylation reactor while a portion of cobalt salt in solution is at the same time recycled to the reactor.

The technical problem that the present application intends to solve is to find an alternative hydroformylation process to the ones of D1 or D2 while keeping the risks of reactor flooding low.

Although D2 contains all the features of the presently claimed process, the proviso of claim 1 excludes the use of a vapor stream carrier to transfer volatile cobalt catalyst back to the hydroformylation reactor. It is however strongly suggested in D2 that this feature is essential to the process, that is a part of the cobalt must be transferred in a volatile state by a vapor stream carrier and eventually injected back into the reactor, especially if one wants to avoid a reactor flooding. Nothing in the prior art suggest that a concentrated solution of cobalt acetate or formate salt coming from the demetallation step could be directly injected and used in the reactor.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/US03/09734

Further remarks :

The recycling of the concentrated aqueous phase should be included in claim 1 as an essential feature (combination of claims 1 and 6).

The US patent N° 4 410 090 (page 4, paragraph 12) does not belong to the prior art of the present application. It should probably read US 5 410 090.

"incorporated by reference" in the last paragraph of the application should be deleted.